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	294289	81289

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Applicant: Timothy A. Hovanec et al.

Appln. No.: 10/682,179

Filing Date: October 9, 2003

Dat : December 3, 2003 Page 1 of 2

Examiner: Group Art Unit:

U.S. PATENT DOCUMENTS

Examiner's Initials*		Document Number	Date MM/YYYY	Name (Family Name of First Inventor)	Class	Sub Class	Filing Date (if appropriate)
/IM/	AR	6,268,154	07/31/2001	Hovanec	C12Q	1/68	
	BR	6,265,206	07/24/2001	Hovanec	B09B	3/00	
	CR	6,207,440	03/27/2001	Hovanec	C12N	C12N	
	DR	5,462,855	10/31/1995	Springer et al.	C12Q	1/68	
	ER	5,462,666	10/31/1995	Kimmel	C02F	3/06	
	FR	4,995,980	02/26/1991	Jaubert	C02F	3/30	
	GR	4,844,013	07/04/1989	de Haan et al.	A01K	63/04	
	HR	4,737,289	04/12/1988	Castaldi et al.	C02F	3/34	
	IR						
	JR						
	KR						
	LR						
	MR						
	NR						

OTHER (Including in this order, Author, Title, Periodical Name, Date, Pertinent Pages, etc.)

	OR	Tal, Yossi et al., "Characterization of the microbial community and nitrogen transformation processes associated with moving bed bioreactors in a closed recirculated mariculture system," Aquaculture, Elsevier Science B.V., 2003, pp. 187-202
	PR	Ehrich, Silke et al, "A new obligately chemolithoautotrophic, nitrate-oxidizing bacterium, *Nitrospira moscoviensis* sp. nov. and its phylogenetic relationship," Arch Microbiol, Springer-Verlag, 1995, pp. 16-23
	QR	Hovanec, Timothy A. et al., "*Nitrospira*-Like Bacteria Associated with Nitrite Oxidation in Freshwater Aquaria," Applied and Environmental Microbiology, American Society for Microbiology, 1998, pp. 258-264
	RR	Schmidt, Thomas M. et al., "Analysis of a Marine Picoplankton Community by 16S rRNA Gene Cloning and Sequencing," Journal of Bacteriology, American Society for Microbiology, July 1991, pp. 4371-4378
	SR	Hovanec, Timothy A. et al., "Comparative Analysis of Nitrifying Bacteria Associated with Freshwater and Marine Aquaria," Applied and Environmental Microbiology, American Society of Microbiology, Aug. 1996, pp. 2888-2896
	TR	Teske, A. et al., "Evolutionary Relationships among Ammonia- and Nitrite-Oxidizing Bacteria," Journal of Bacteriology, American Society for Microbiology, Nov. 1994, pp. 6623-6630
	UR	Pommerening-Roser, Andreas et al., "Phylogenetic Diversity with the Genus *Nitrosomonas*," System Appl. Microbiol., Gustav Fischer Verlag, 1996, pp. 344-351
	VR	Kowalchuk, George A., "Analysis of Ammonia-Oxidizing Bacteria of the β Subdivision of the Class *Proteobacteria* in Coastal Sand Dunes by Denaturing Gradient Gel Electrophoresis and Sequencing of PCR-Amplified 16S Ribosomal DNA Fragments," Applied and Environmental Microbiology, American Society for Microbiology, Apr. 1997, pp. 1489-1497

10/25/2007

/Irene Marx/

	WR	Burrell, Paul C. et al., "Microbiology of a Nitrite-Oxidizing Bioreactor," Applied and Environmental Microbiology, American Society for Microbiology, May 1998, pp 1878-1883				
	XR	Schramm, Andreas et al., "Identification and Activities in Situ of *Nitrosospira* and *Nitrospira* spp. As Dominant Populations in a Nitrifying Fluidized Bed Reactor," Applied Environmental Microbiology, American Society for Microbiology, Sept. 1998, pp. 3480-3485				
	YR	Juretschko, Stefan et al., "Combined Molecular and Conventional Analyses of Nitrifying Bacterium Diversity in Activated Sludge: *Nitrosococcus mobilis* and *Nitrospira*-Like Bacteria as Dominant Populations," Applied and Environmental Microbiology, American Society for Microbiology, Aug. 1998, pp. 3042-3051				
	ZR	Hiorns, William D., "Amplification of 16S Ribosomal RNA Genes of Autotrophic Ammonia-oxidizing Bacteria Demonstrates the Ubiquity of Nitrosospiras in the Environment," Microbiology, Great Britain, 1995, pp. 2793-2800				
	AAR	Mobarry Bruce K. et al., "Phylogenetic Probes for Analyzing Abudance and Spatial Organization of Nitrifying Bacteria," Applied and Environmental Microbiology, American Society for Microbiology, June 1996, pp. 2156-2162				
	BBR	Koops, H.P. et al., "Classification of Eight New Species of Ammonia-Oxidizing Bacteria," Journal of General Microbiology, 1991, pp 1689-1699				
	CCR	Navarro, Elisabeth et al., "Characterization of Natural Populations of *Nitrobacter* spp. Using PCR/RFLP Analysis of the Ribosomal Intergenic Spacer," Archives of Microbiology, 1992, pp. 107-115				
	DDR	Navarro, E. et al., "Genetic Structure of Natural Populations of *Nitrobacter* in an Aquatic Environment," Hydrobiologia, Kluwer Academic Publishers, 1995, pp. 43-48				
	EER	Stephen, John R. et al. "Molecular Diversity of Soil and Marine 16S rRNA Gene Sequences Related to β-Subgroup Ammonia-Oxidizing Bacteria," Applied and Environmental Microbiology, American Society for Microbiology, Nov. 1996, pp. 4147-4154				
	FFR	Utaker, Janne B. et al., "Phylogenetic Analysis of Seven New Isolates of Ammonia-Oxidizing Bacteria Based on 16S rRNA Gene Sequences," System Appl. Microbiol., Gustav Fischer Verlag, 1995, pp. 549-558				
	GGR	Wagner, Michael et al., "Probing Activated Sludge with Oligonucleotides Specific for Proteobacteria: Inadequacy of Culture-Dependent Methods for Describing Microbial Community Structure," Applied and Environmental Microbiology, American Society for Microbiology, May 1993, pp. 1520-1525				
	HHR	Wagner, Michael et al., "Identification and *in situ* Detection of Gram-negative Filamentous Bacteria in Activated Sludge," System. Appl. Microbiol., Gustav Fischer Verlag Stuttgart Jena, 1994, pp. 405-417				
	IIR	Wagner, Michael et al.; "*In situ* Identification of Ammonia-oxidizing Bacteria," System. Appl. Microbiol., Gustav Fischer Verlag Stuttgart Jena, 1995, pp. 251-264				
	JJR	Wagner, Michael et al., "*In situ* Analysis of Nitrifying Bacteria in Sewage Treatment Plants," Wat. Sci. Tech., Elsevier Science Ltd., 1996, pp. 237-244				
	KKR	Ward, B.B., "Nitrification and Denitrification: Probing the Nitrogen Cycle in Aquatic Environments," Microbial Ecology, Springer-Verlag, 1996, pp.247-261				
	LLR	Ward, B.B. et al., "Phylogenetic Diversity of Natural Populations of Ammonia Oxidizers Investigated by Specific PCR Amplification," Microbial Ecology, Springer-Verlag, 1997, pp. 87-96				
	MMR	Voytek, M.A. et al., "Detection of Ammonium-Oxidizing Bacteria of the Beta-Subclass of the Class *Proteobacteria* in Aquatic Samples with the PCR," Applied and Environmental Microbiology, American Society for Microbiology, 1995, pp. 1444-1450				
	NNR	Amann, Rudolf et al., "Phylogenetic Identification and In Situ Detection of Individual Microbial Cells with Cultivation," Microbiological Reviews, American Society for Microbiology, Mar. 1995, pp. 143-169				
	OOR	Ehrich et al, "GenEMBL Accession No. X82558, Aug. 1995				

Examiner
Date Considered: /Irene Marx/ 10/25/2007

*EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 2

Complete if Known	
Application Number	10/682,179
Filing Date	10/09/2003
First Named Inventor	TIMOTHY A. HOVANEC
Art Unit	1642
Examiner Name	
Attorney Docket Number	081289-0294289

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
/IM/	A1	TESKE, A. ET AL., Evolutionary Relationships among Ammonia- and Nitrite-Oxidizing Bacteria, Journal of Bacteriology, American Society for Microbiology, Vol. 176 (No. 21), pp. 6623-6630, (1994).	
	A2	HOVANEC, T.A. ET AL., Identification of Ammonia- and Nitrite-Oxidizing Bacteria Responsible for Nitrification in Saltwater Aquaria, Abstracts of the General Meeting of the American Society for Microbiology, American Society of Microbiology (Orlando, Florida), pp. 499-500, (May 21, 2001).	
	A3	HOVANEC, T.A. ET AL., Large-Scale Culture of Novel Ammonia- and Nitrite-Oxidizing Bacteria, Abstracts of the American Society for Microbiology, American Society for Microbiology (Salt Lake City, Utah), pp. 351, (May 20, 2002).	
	A4	HOVANEC, TIMOTHY A. ET AL., Characterization of the Nitrifying Bacteria in Aquaria and Mono Lake, California, Using Molecular Methods, Dissertation Abstracts International, Vol. 60 (No. 2), pp. 453, (August 1999).	
	A5	REGAN, JOHN A. ET AL., Diversity of Nitrifying Bacteria in Full-Scale Chloraminated Distribution Systems, Water Research, Elsevier Science Ltd., pp. 197-205, (2002).	
	A6	BARTOSCH, SABINE ET AL., Identification of Nitrite-Oxidizing Bacteria with Monoclonal Antibodies Recognizing the Nitrite Oxidoreductase, Applied and Environmental Microbiology, American Society for Microbiology, Vol. 65 (No. 9), pp. 4126-4133, (Sept. 1999).	
	A7	BURRELL, PAUL C. ET AL., Identification of Bacteria Responsible for Ammonia Oxidation in Freshwater Aquaria, Applied and Environmental Microbiology, American Society for Microbiology, Vol. 67 (No. 12), pp. 5791-5800, (Dec. 2001).	
	B1	UTAKER, JANNE B. ET AL., Phylogenetic Analysis of Seven New Isolates of Ammonia-Oxidizing Bacteria Based on 16S rRNA Gene Sequences, Systematic and Applied Microbiology, Gustave Fischer Verlag, Vol. 18 (No. 4), pp. 549-559, (1995).	
	B2	WAGNER, MICHAEL ET AL., Identification and in situ Detection of Gram-Negative Filamentous Bacteria in Activated Sludge, Systematic and Applied Microbiology, Gustav Fischer Verlag, Vol. 17 (No. 3), pp. 405-417, (1994).	
	B3	WAGNER, MICHAEL ET AL., In situ Identification of Ammonia-Oxidixing Bacteria, Systematic and Applied Microbiology, Gustav Fischer Verlag, Vol. 18 (No. 2), pp. 251-264, (1995).	

Examiner Signature	/Irene Marx/	Date Considered	10/25/2007

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1.8181818 of 1

Complete if Known	
Application Number	10/682,179
Filing Date	10/09/2003
First Named Inventor	TIMOTHY A. HOVANEC
Group Art Unit	1642
Examiner Name	
Attorney Docket Number	081289-0294289

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
/IM/	B3	WAGNER, MICHAEL ET AL., "In situ Identification of Ammonia-Oxidixing Bacteria," Systematic and Applied Microbiology, Gustav Fischer Verlag, Vol. 18 (No. 2), p. 251-264,	
/IM/	B4	WARD, B.B,, "Nitrification and Denitrification: Probing the Nitrogen Cycle in Aquatic Environments," Microbial Ecology, Vol. 32 (No. 3), p. 247-261,	

Examiner Signature	/Irene Marx/	Date Considered	10/25/2007

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(SUPPLEMENTAL)

(Use as many sheets as necessary)

Sheet 1 of 1

Complete If Known	
Application Number	10/682,179
Filing Date	10/09/2003
First Named Inventor	TIMOTHY HOVANEC
Art Unit	1642
Examiner Name	
Attorney Docket Number	081289-0294289

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	US-			
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/IM/	1	WO 99/32603 A	07/01/1999	Aquaria	entire document	X

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/IM/	1	TESKE, A., Nitrococcus mobilis (ATCC 25380) 16S ribosomal RNA (16S rRNA) gene, EBI Accession no. NM16SR2, pp. whole document, (01/06/1995).	X

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